

DESCRIPTION

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OF A

NEW SPECIES OF TREMATODE WORM

(*FASCIOLA GIGANTICA*.)

BY

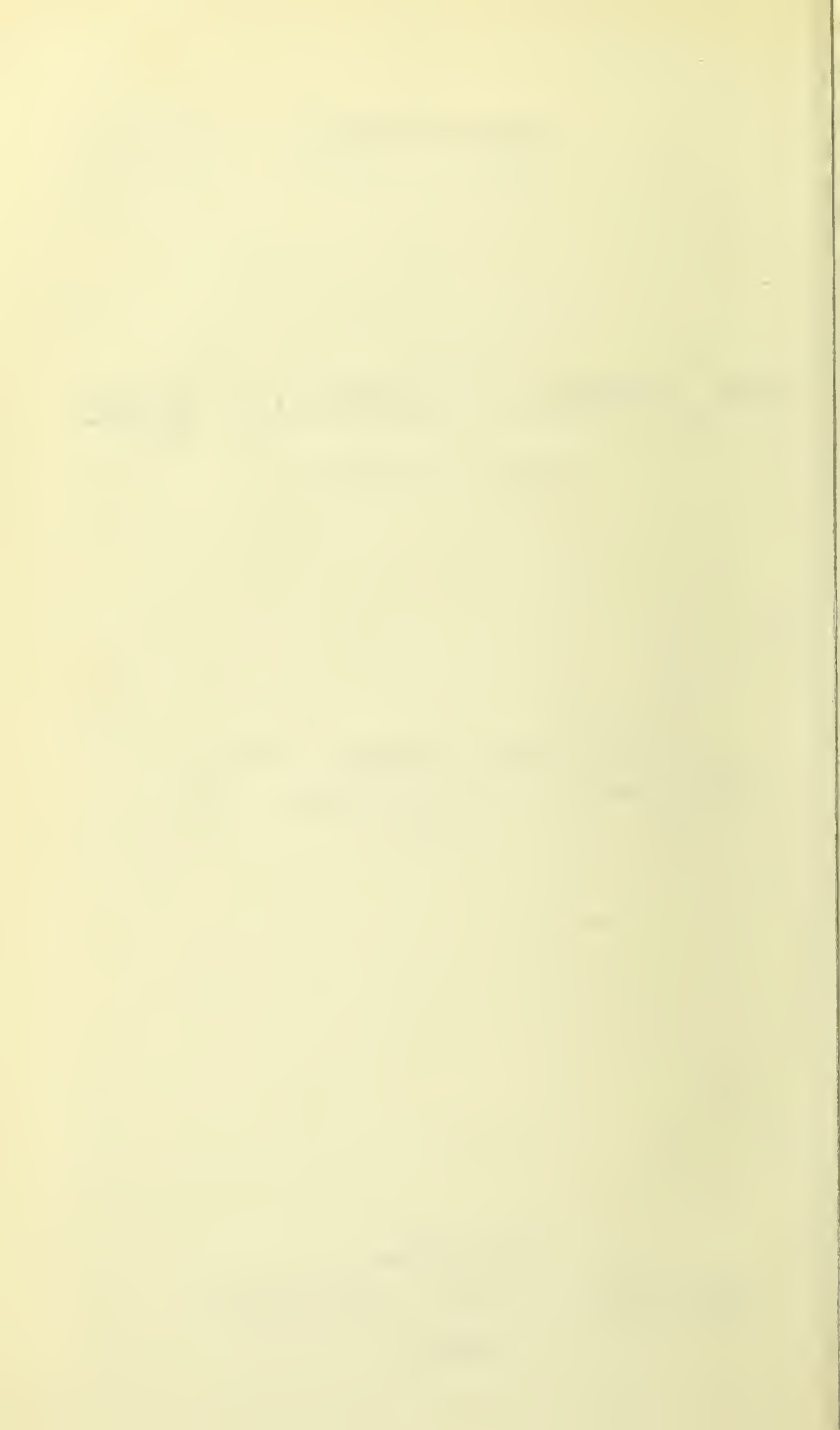
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*Description of a New Species of Trematode Worm (Fasciola gigantica).*\* By T. SPENCER COBBOLD, M.D., &c.

In a paper "On the Anatomy of the Giraffe," communicated to the Royal Physical Society of Edinburgh, 5th April 1854, and published in the June Number of the Annals of Natural History for the same year, we cursorily alluded to the circumstance of our having detected a species of fluke in the ducts of the liver of the above-mentioned ruminant.

No fewer than forty such individuals were washed out of the gland by means of a syringe; but as the animal had been dead nine days, some of the entozoa had acquired a dark, semiputrid-looking appearance, and it was not expected that the vascular or digestive tubes would be sufficiently fresh to admit of artificial distension. With the view of strengthening the canals, they were immediately placed in strong spirit, by which precaution we succeeded in injecting some of the specimens, though not in so complete or perfect a manner as could be desired.

The trematode worm to which we propose to apply the combined generic and specific title of *Fasciola gigantica*, is possibly confined in its habitat to the situation just indicated, which will account for its having hitherto escaped observation; yet, seeing how close are the structural and physiological affinities connecting the genus *Camelopardalis* with the *Cervidæ*, *Antilopidæ*, and *Camelidæ*, it is highly probable that certain of the numerous species of these allied families may be infested by the same entozoon. In the case of the common fluke (*Fasciola hepatica*, Linn.), Rudolphi mentions its occurrence in eleven species of Mammalia, six of the animals thus infested being ruminants.

The generic name *Fasciola* may be objected to, because the term *Distoma* has been, of late, so universally employed by naturalists in reference to the flukes, &c. We think, with

\* Read at the Glasgow Meeting of the British Association, Sept. 1855.

M. Blanchard, there is no good reason for rejecting the original title given by Linnæus, but that it is rather convenient to retain it, in contradistinction to the term *Distoma*, substituted by Rudolphi, Bremser, Dujardin, and others. M. Blanchard, who has done so much to clear up disputed points concerning the organization of the Planariæ and Trematoda, makes very broad distinguishing characters between the genera *Fasciola* and *Distoma*; for example,—in the former genus he includes only those flukes which have the digestive apparatus ramifying or dendritic, as in the case of *Fasciola hepatica*, and as is also seen in the undescribed species now before us. In the genus *Distoma*, on the other hand, he characterizes the alimentary canal as consisting of an œsophagus dividing into two intestinal tubes which terminate in cœca, and do not present any ramification. The *Distoma lanceolatum* (Mehlis) is instanced as an illustration of this type of structure.

The trematode now before the Association, and which we have designated *Fasciola gigantea*, varies in length from an inch and a half to nearly three inches, most of the specimens being about two inches; their breadth averages three lines, some attaining the third of an inch. The general form of the body is elongated, and rounded at the caudal extremity, in which latter feature it differs very markedly from *F. hepatica*. The larger or more fully developed individuals present slight irregularities or crenations of the lateral margins near the neck; a character, however, by no means constant. The borders are more attenuated than in the common species, and the substance of the body thinner. The anterior extremity is prolonged forward about two lines, and terminates in a sucker half a line in diameter. There is no evident distinction between what has been termed head and neck, but the part to which the latter title is assigned is very prominent on the dorsal surface, from the distended condition of the oviducts and seminal reservoir lying immediately beneath.

The digestive apparatus commences by a short œsophagus proceeding downward from the base of the oral sucker; while in the neck it divides into two slightly diverging trunks which pass on either side of the ventral sucker, again approximate, and are continued to the tail. On their passage

down, the two principal trunks lie almost parallel, near the mesial line of the body; they give off eight or ten secondary branches, which proceed to the lateral margins, and end in blind cœca; small twigs also proceed from the main tubes inwards, but they do not extend beyond the middle line, and present very few subdivisions. The ramifying systems of digestive cœca in each lateral segment of the animal, are not absolutely symmetrical, neither is there uniformity in respect of number; they preserve, however, a general resemblance both in the degree of subdivision and in the direction which the secondary trunks assume. The downward direction of the branches, and the angle of divergence resulting from such a disposition of parts form a striking contrast to the arrangement of that system of canals situated nearer the dorsal aspect of the body, and usually regarded as the circulatory apparatus. These vessels are represented in *F. gigantea* by a single median trunk, from which numerous primary branches pass obliquely upward to the sides.

We may here remark, that considerable dispute has arisen among helminthologists, as to the propriety of regarding this series of canals as vascular; some have even expressed doubts as to the presence of any true organs of circulation in the trematode worms, and the distinguished authority Van Beneden holds this opinion. Those who regard the superficial set of tubes in the light of an excretory or secreting gland, ground their view on the circumstance of a supposed caudal opening, through which matters thrown into the median vessel frequently pass. M. Blanchard has shown the aperture in question to result from over-distension of the canal, which readily gives way at this, its weakest point; our own attempts to inject have confirmed this observation.

Accepting M. Blanchard's explanation as correct, we have to state further, in regard to these vessels, that they exhibit less regularity of distribution than obtains in the branching tubes of the alimentary system, and they inosculate freely from one end of the body to the other. Irrespective of these distinguishing marks, there is a disparity of calibre between the

two sets of tubes, and all their peculiarities taken together strongly convince us of their true vascular nature.

The external spiral appendages, with the minute orifices of the reproductive organs, occupy the same relative position as in *F. hepatica*, i. e., lying directly in front of the second or great ventral sucker. In reference to these structures—the nervous system and other special parts—it is unnecessary to give additional particulars; their characters resembling in all respects those seen in the typical species, and which are now so fully understood.

*Fasciola gigantea*, Cobbold.

Corpore compresso, elliptico-lanceolato, tres uncias longo, antrosum attenuato; ore hausterioque anticis; collo elongato, cylindrico; caudâ rotundatâ; ventriculo dendritico, ramis clausis.

Habitat in hepate Camelopardalis Giraffæ.

*Appendix.*—In the accompanying Plate, figures have been introduced of two kinds of Cericaria, which were found associated with the above-described trematode. One group of these cysts infested the liver, where they appeared either at the surface, in the form of small, hard, projecting points, or were thinly scattered throughout the substance of the gland. They were very numerous, and some had undergone calcareous degeneration. The other, a small group, consisted of three semitransparent cysts, imbedded in the cellular aponeurosis surrounding the stylo-glossi and lingualis muscles.

*Description of Plate VII.*

A. Dorsal aspect of *Fasciola gigantea*, representing, in particular, the vascular system, which has been injected with vermilion. At the lower part, several of the vessels ruptured, producing extravasation.

B. Ventral surface of another specimen of the same species. It illustrates the disposition of the alimentary apparatus, the tubes of which have been filled with artificial ultramarine.

Fig. 1. Cyst from the liver, with shreds of glandular substance adhering. Natural size.

Fig. 2. Cysticercus, or trematode larva removed from the cyst. Enlarged 3 diameters.



- Fig. 3. The same, further magnified, showing the head and neck unfolded, and separated from the caudal vesicle.
- Fig. 4. Head and neck, exhibiting the oval sucker. Magnified 25 diameters.
- Fig. 5. Section of a cyst which has enlarged and undergone calcareous degeneration. The deposits are arranged in irregular concentric laminae, and the investing sheath is much hypertrophied. Natural size.
- Fig. 6. Oval semitransparent cyst from the cellular substance surrounding the muscles at the base of the tongue. This investing capsule is composed of two layers, the outer of condensed arcolar tissue, the inner of well-marked epithelium. Natural size.
- Fig. 7. Enclosed endocyst, which was separated from the outer envelope by a transparent fluid. Natural size. (See Fig. 14.)
- Fig. 8. Embryo or larva removed from the endocyst, and partly unrolled. Natural size.
- Fig. 9. Embryo in its coiled state, enlarged to show the cephalic sucker.
- Fig. 10. Sectional view of the same. A tube is seen passing towards the caudal extremity, which is in this larva attenuated; it is apparently intestinal, but we did not succeed in tracing its connection with the sucker. A number of markings cross the body transversely, and these correspond with linear depressions or divisions on the integument.
- Fig. 11. Slightly magnified view of two ova-like bodies or cells, from the caudal extremity of the embryo. They could be seen with a pocket lens, and probably are the remnant of germ cells, which, before the cercaria passed into the pupa condition, gave rise to a progeny of embryos, differing from the parent or *nurse* cercaria.
- Fig. 12. One of these germ cells, showing the included formative cellules. Magnified 60 diameters.
- Fig. 13. Formative cellule, showing the nucleus and nucleolus. Magnified 100 diameters.
- Fig. 14. Irregular albuminoid particles, constituting the structure of the endocyst. They adhered closely to each other, and presented no distinct cell wall. Magnified 250 diameters.
- Fig. 15. Spherical cells, forming the mass of the parenchymatous substance of the embryo, and exhibiting various nuclei, or granular contents. Magnified 250 diameters.







